



21st Century Surface Combatant

SC-21

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21st Century Surface Combatant Modeling & Simulation

**DEFENSE MODELING &
SIMULATION OFFICE (DMSO)
INDUSTRY DAYS**

May 22-23, 1997

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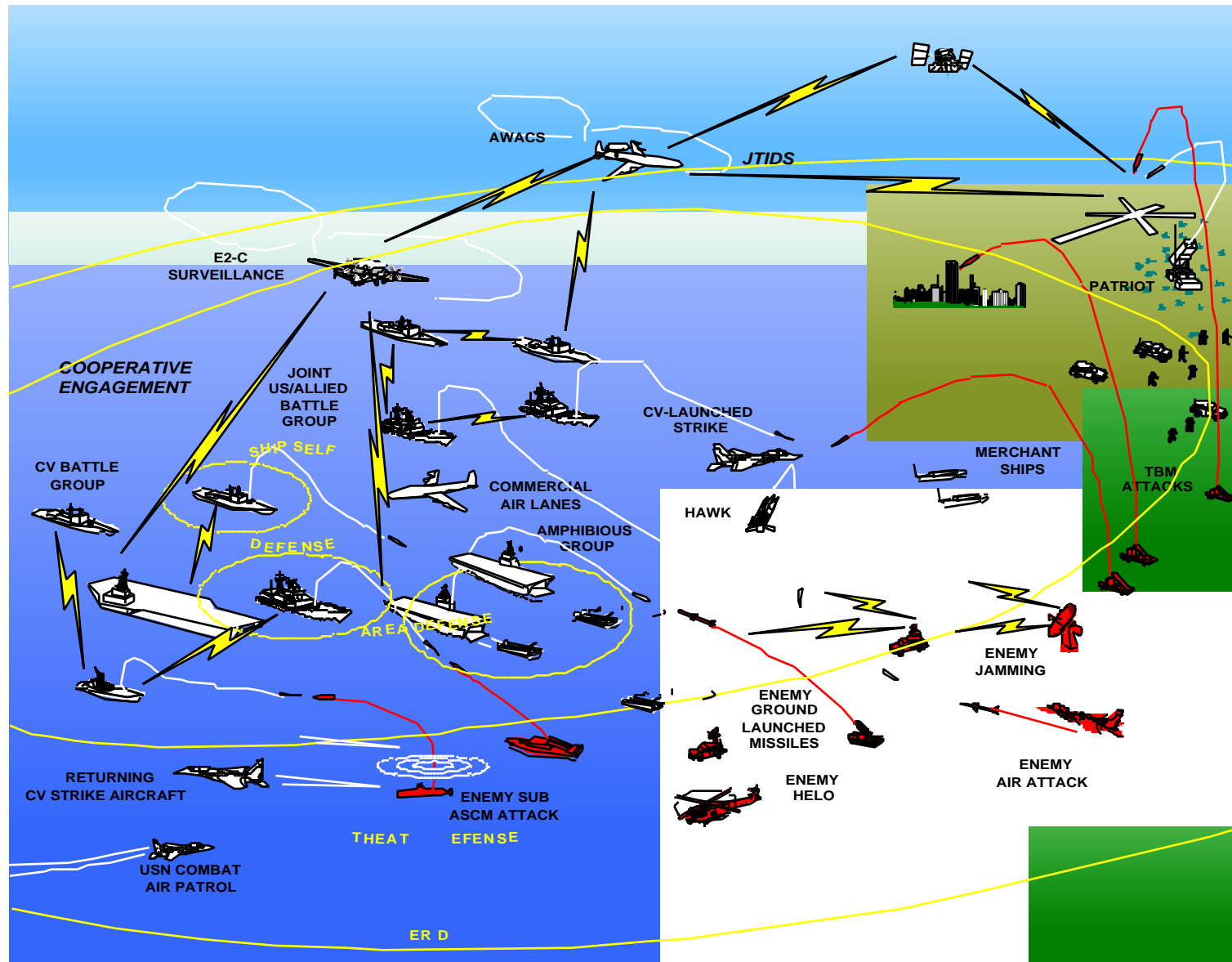
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Outline

- **SC 21 Modeling & Simulation Master Plan**
- **SC 21 Modeling & Simulation Implementation Plan**
- **SC 21/Virtual Test & Training Range (VTTR) Partnership Program**

LITTORAL ENVIRONMENT



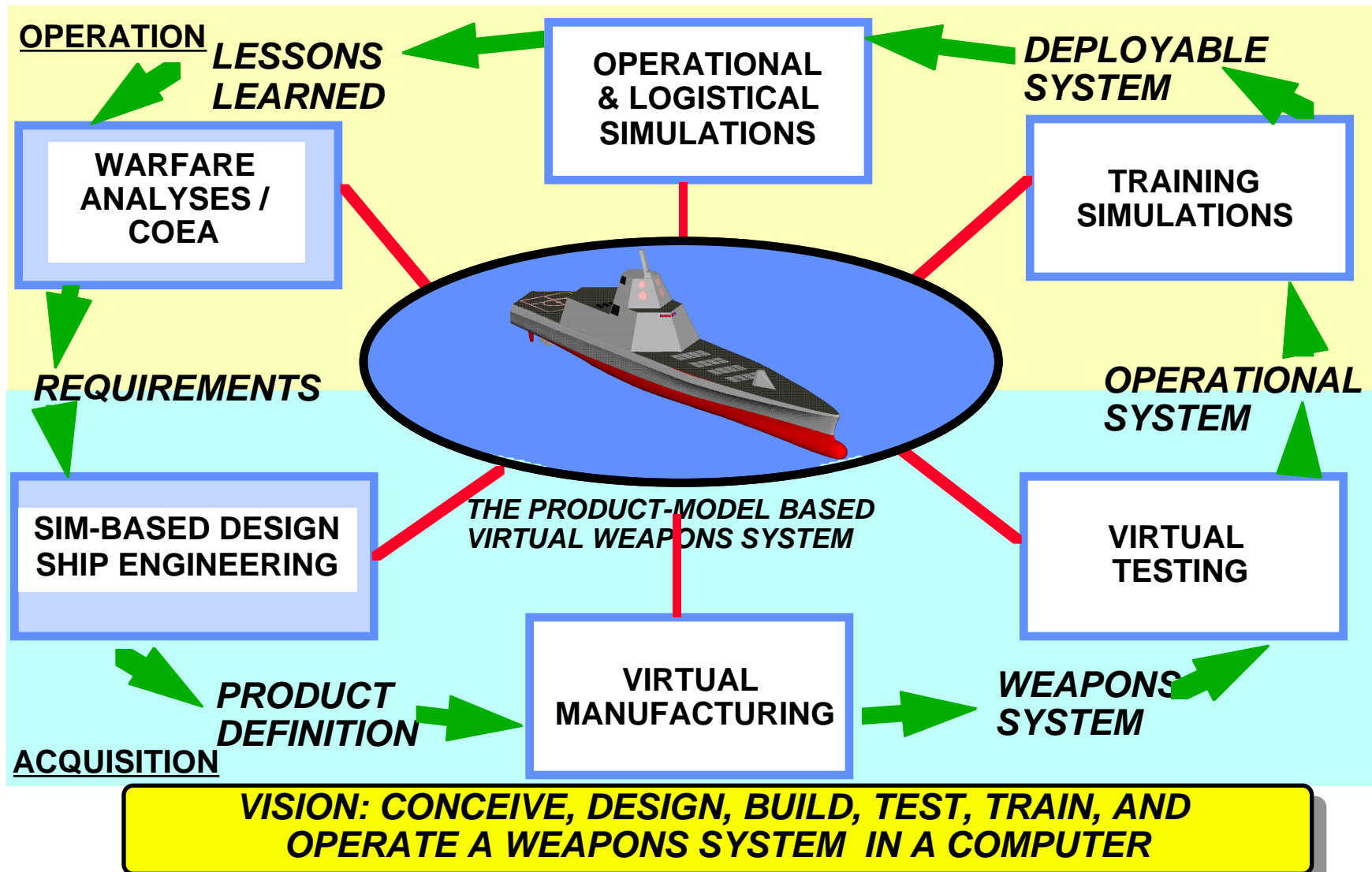


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Add honeycomb slide here

SIMULATION-BASED DESIGN THE VIRTUAL SHIP LIFE CYCLE

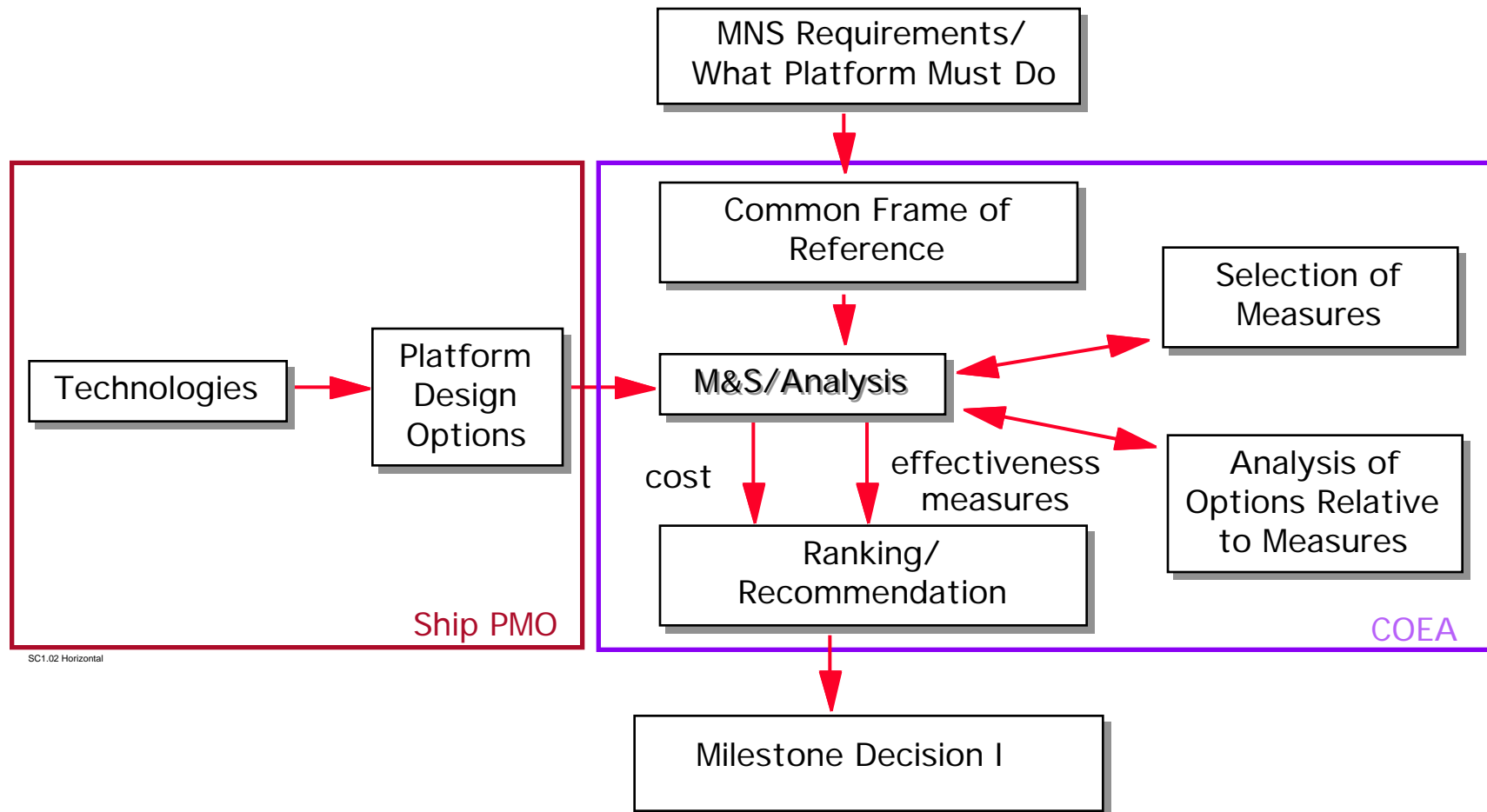




SC 21 Modeling & Simulation Master Plan

- Signed 11 Oct 96 by CAPT Mahoney
- Briefed to industry at 22 Nov 96 M&S Industry Day
- On SC 21 homepage
 - <http://sc21.crane.navy.mil>
- High level plan consistent with DOD/DON M&S vision

Assessment Process for Milestone I



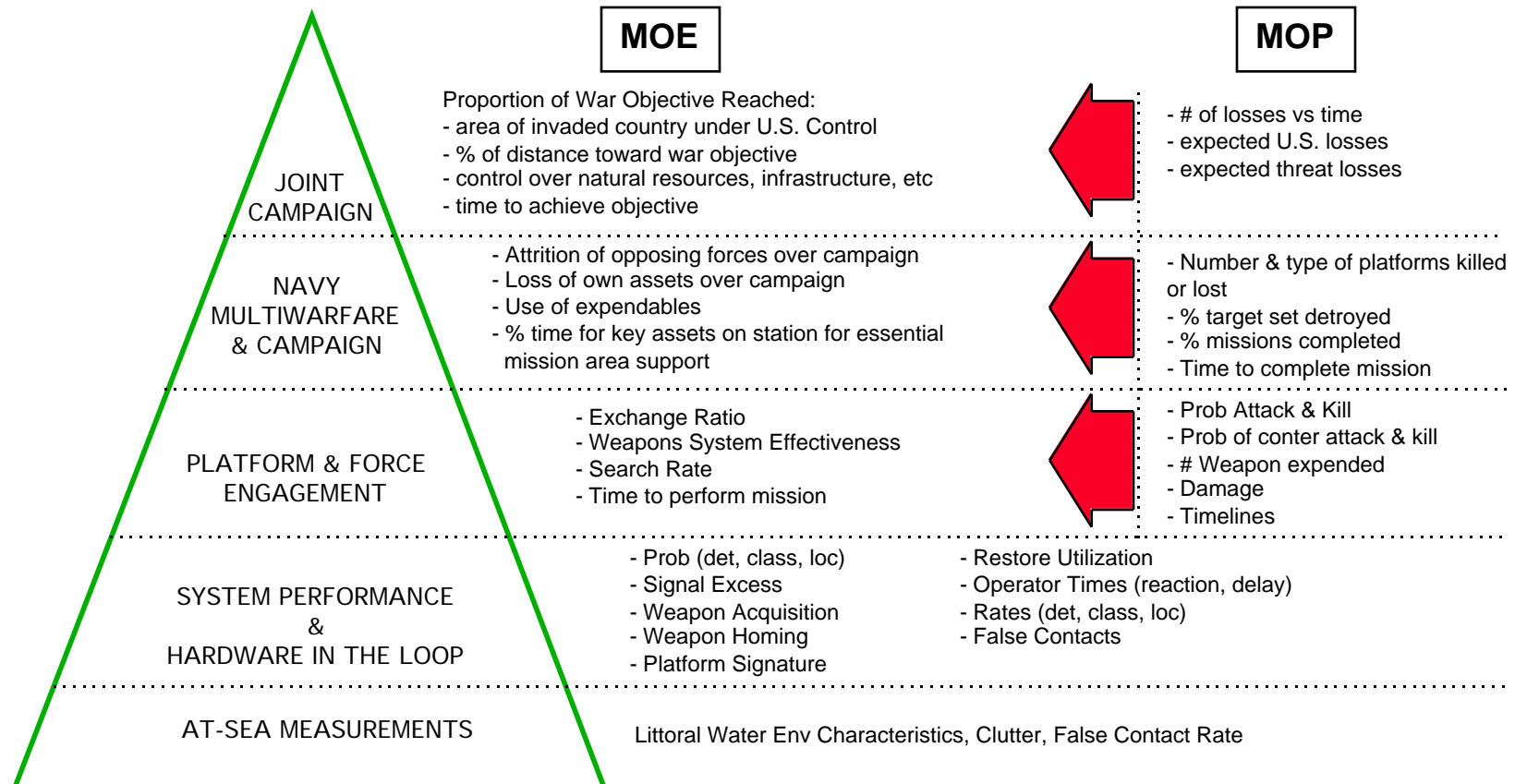


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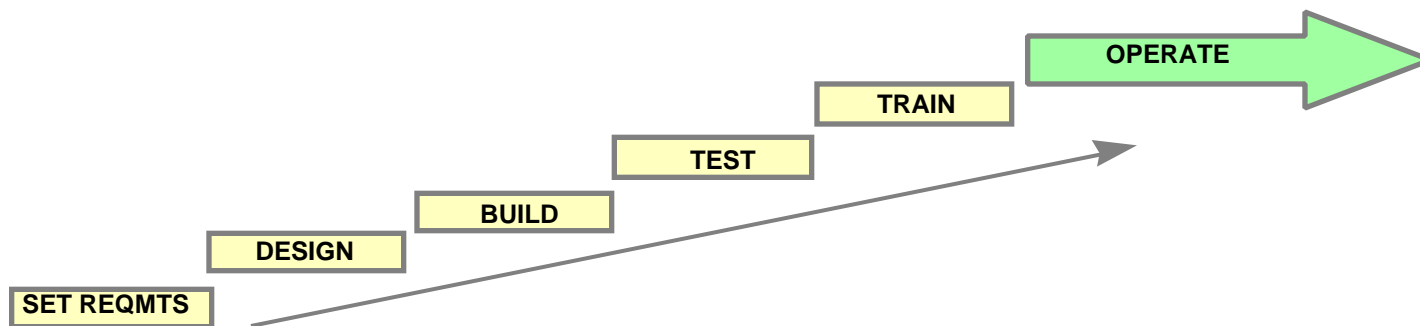
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Add COEA list of models slide here

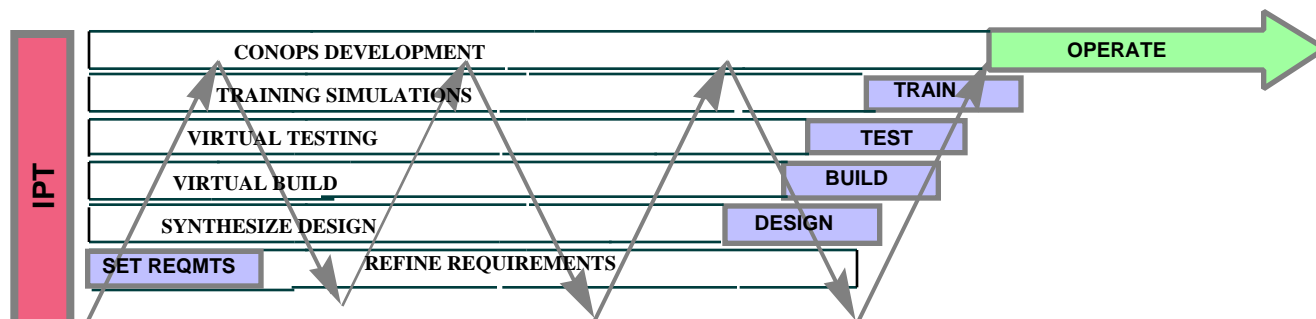
REPRESENTATIVE M&S STUDY METRICS



Modeling and Simulation in the System Engineering Process

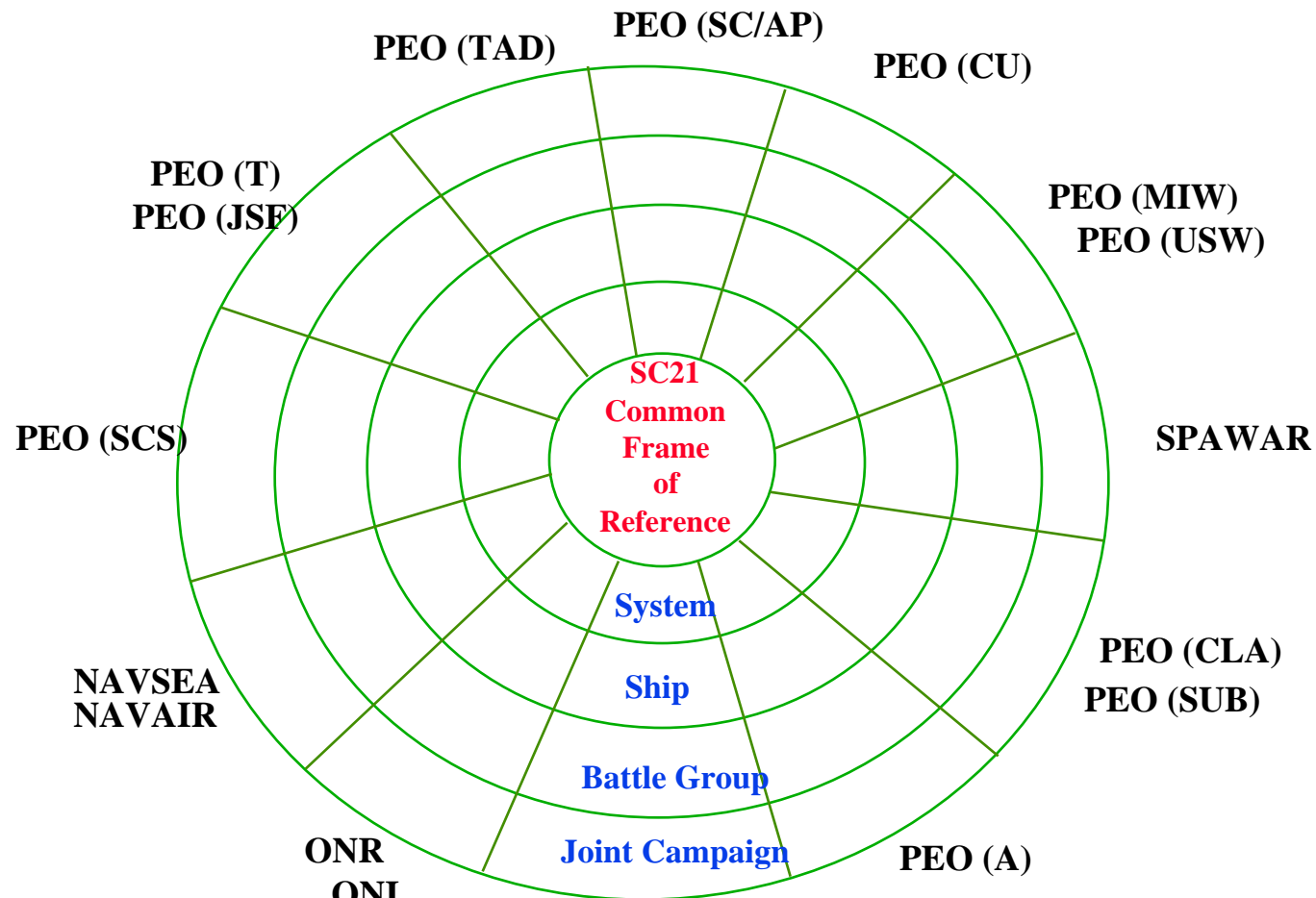


TRADITIONAL: 1 ITERATION



Modeling and Simulation: MULTIPLE ITERATIONS BEFORE OPERATION

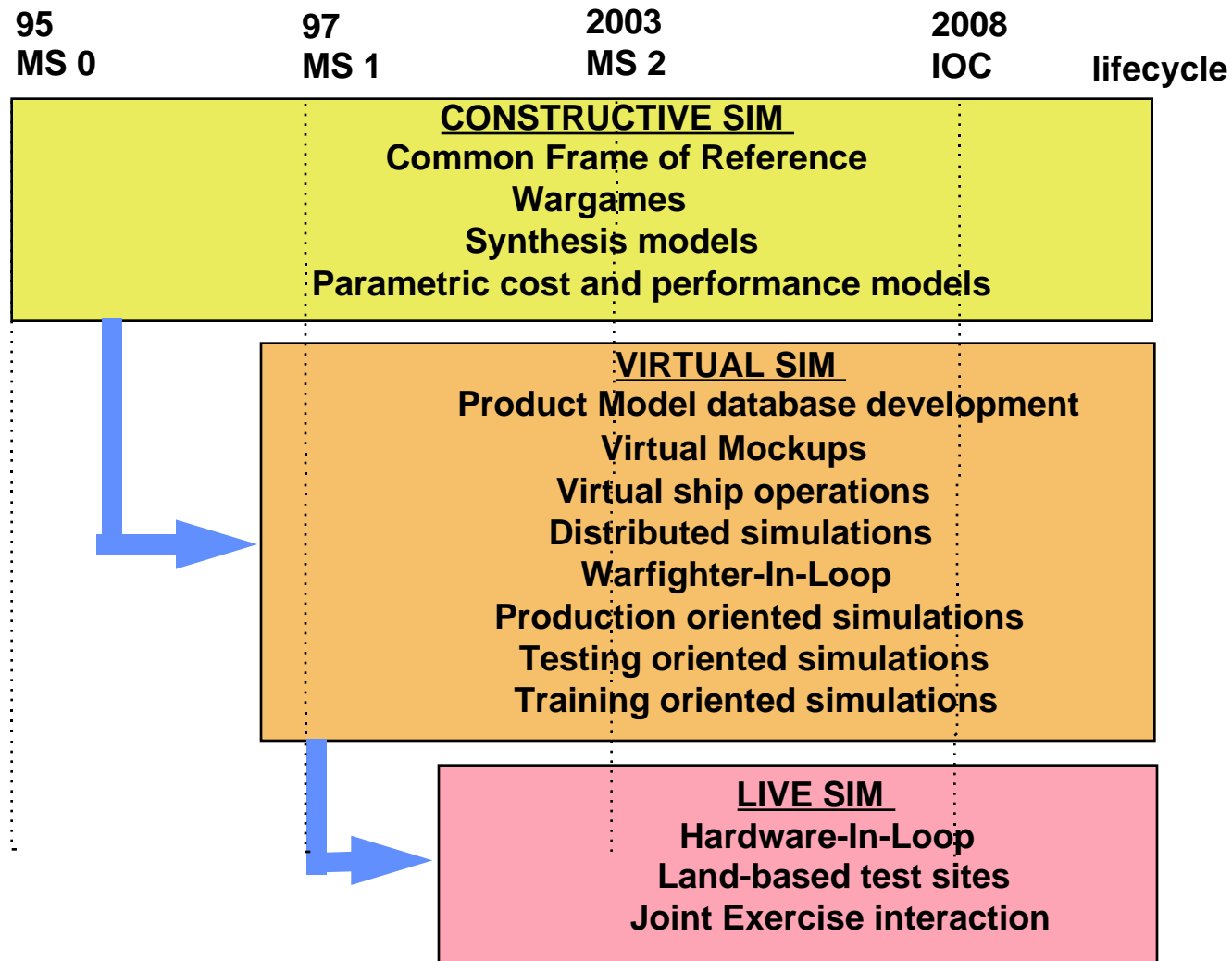
SC 21 Simulation Based Acquisition Roles and Responsibilities



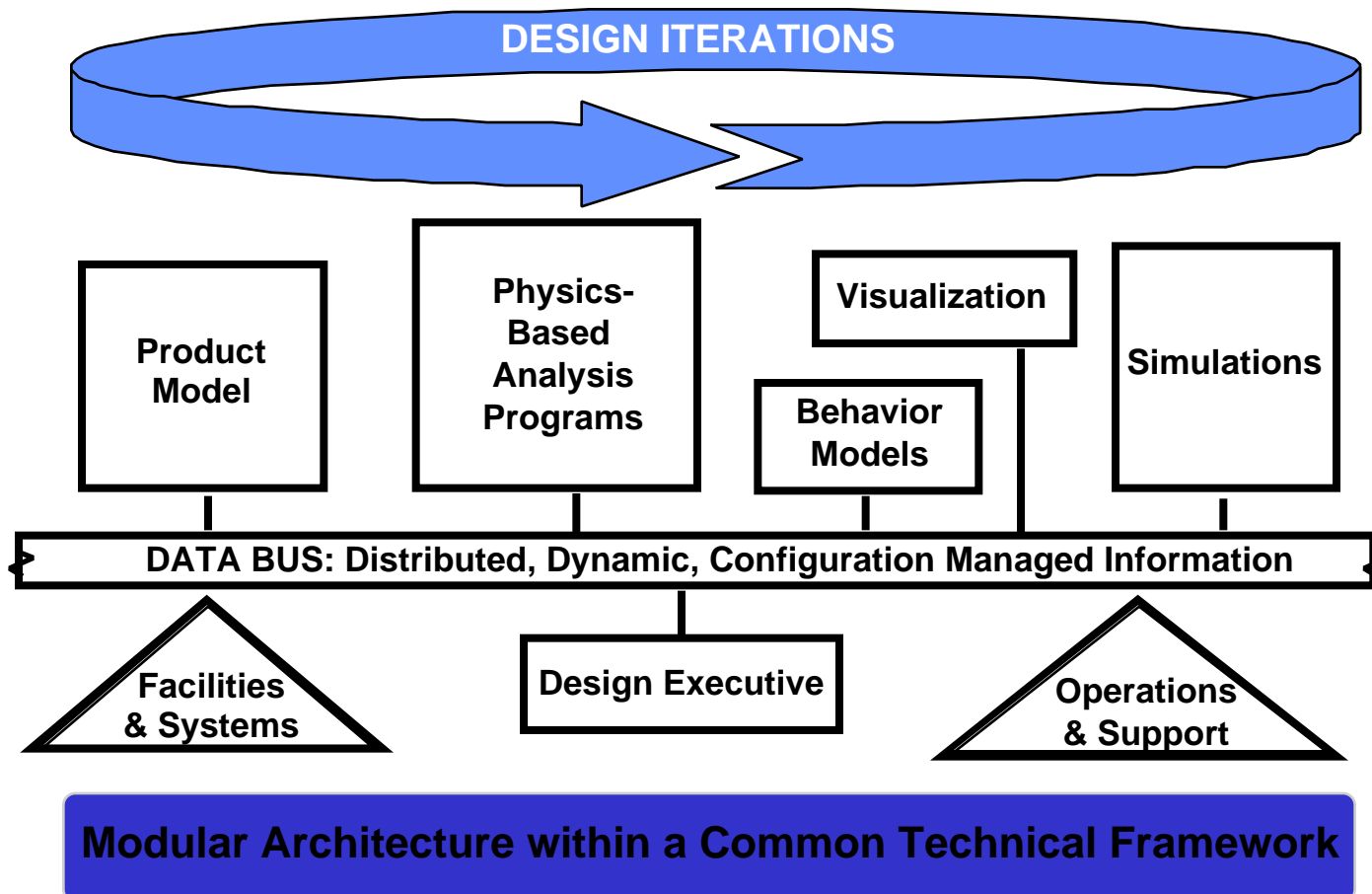
Sectors = Model Ownership

Circular Areas = Warfare Environment

Model & Simulation Sequence



SC21 Simulation Based Acquisition System Technical Concept





SC 21 Modeling & Simulation Implementation Plan

- **Concept approved by SC 21 M&S WIPT 10 Mar 97**
- **Detailed plan to implement the M&S Master Plan vision**
 - maps M&S into the program acquisition schedule
 - outlines government and industry responsibilities
 - links with SEMP and TEMP
 - describes SC 21 Smart Product Model life cycle concept
 - lists tasks and deliverables for FY 98 - 02
 - gives financial plan for M&S tasks

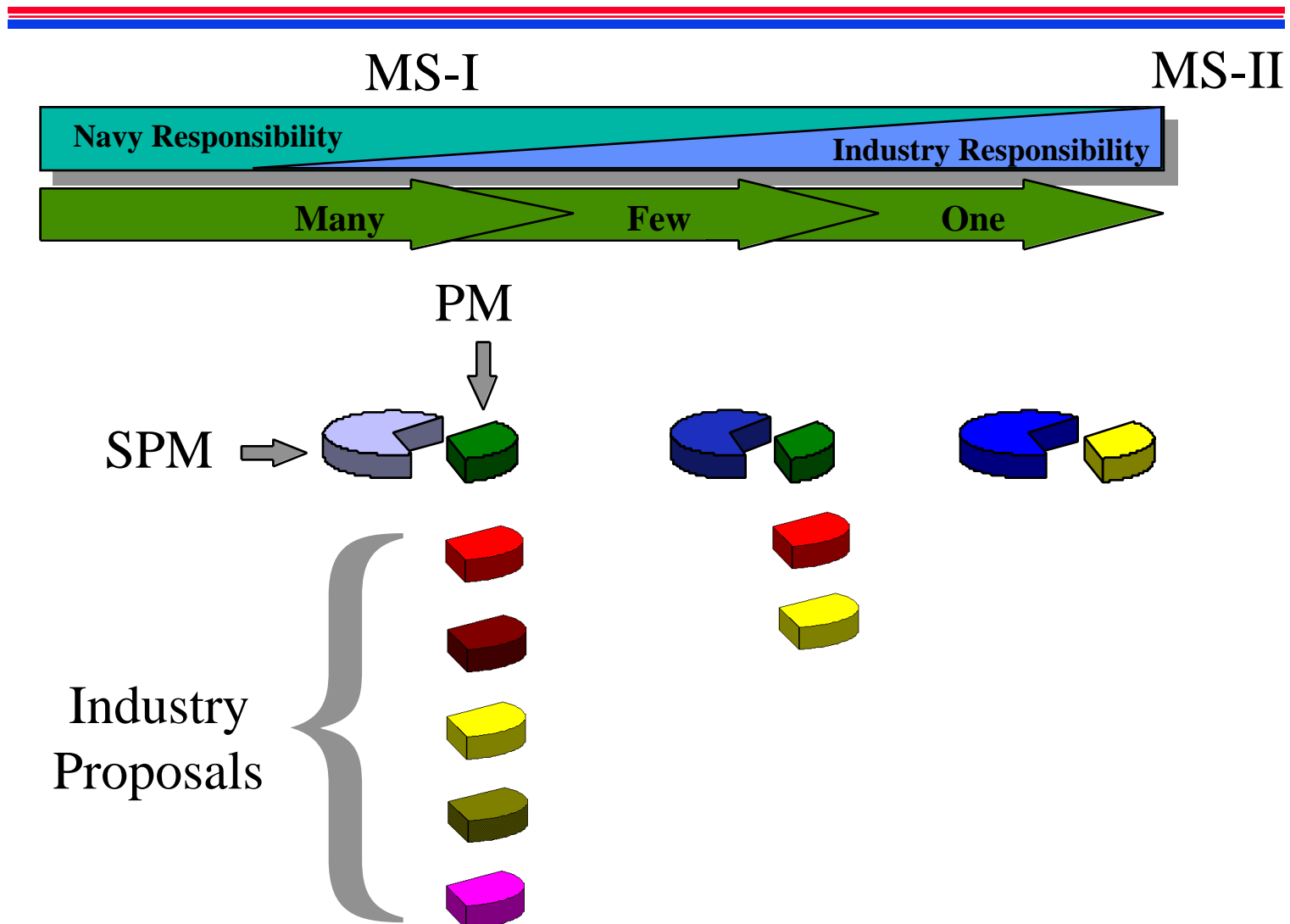


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SC-21

Add Acq Strategy slide here

M&S Strategy



Gov't/Industry Responsibilities

- **For SPM the government will:**
 - prepare the performance specification for SPM
 - develop the test procedure/evaluation criteria
 - establish Navy SPM Team to provide advisement and support for consortia development of the SPM
 - specify the data format for industry ship concepts
 - accredit models for SC 21 application
 - perform concept feasibility demonstrations
 - provide industry access to government models
 - manage development and accomplishment of Configuration Management, VV&A, and Risk Mitigation Plans for SPM

Gov't/Ind Responsibilities (cont)

- **Industry will be responsible to:**
 - develop SPM with support of Navy Team
 - prepare CMP, VV&A and Risk Mitigation Plans for the SPM
 - develop Integrated Product Data Environment (IPDE) and provide access to it to the government

Schedule

- **April - Aug 97**
 - issue RFI for SPM performance specification
 - establish Navy SPM Team
 - write SPM performance specification
- **Aug/Sept 97**
 - total ship concept RFP will be issued
- **Jan 98 - Jan 99**
 - multiple consortia contracts
 - » work together to build SPM iaw Perf Spec
 - » independently develop total ship concepts
 - » quarterly SPM reviews

Schedule (continued)

- **Jan 99 - Apr 01**
 - downselect from multiple to few consortia
 - » continue to work together on SPM
 - » independently develop preliminary design concepts
- **Apr 01**
 - use SPM as one tool to evaluate preliminary design concepts
 - downselect from few to one consortium
 - winning consortium will customize SPM to support manufacturing, maintainability, operational support, upgrades, etc.

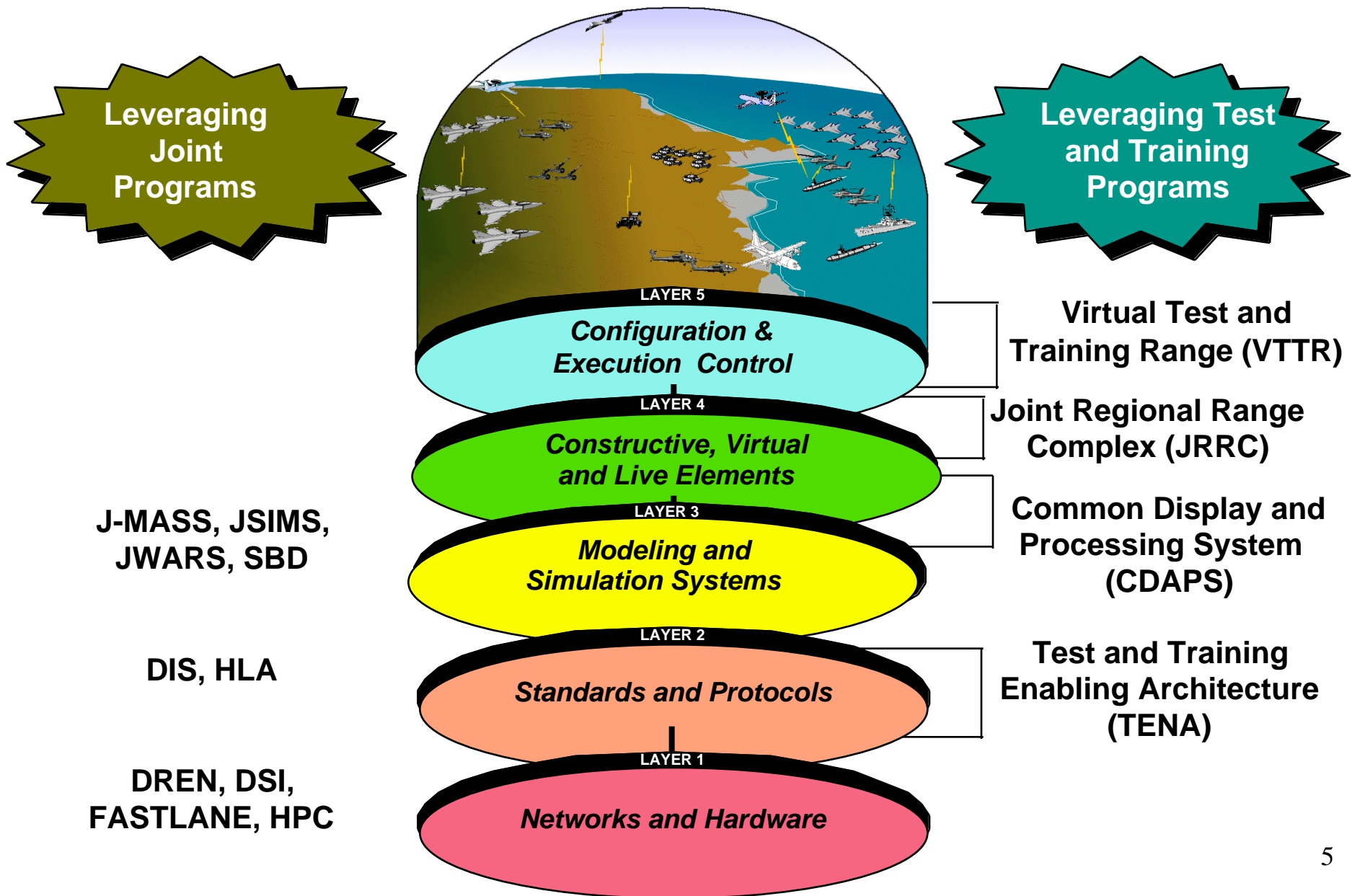
VTTR IMPLEMENTATION STRATEGY

SC 21 / VTTR Partnership

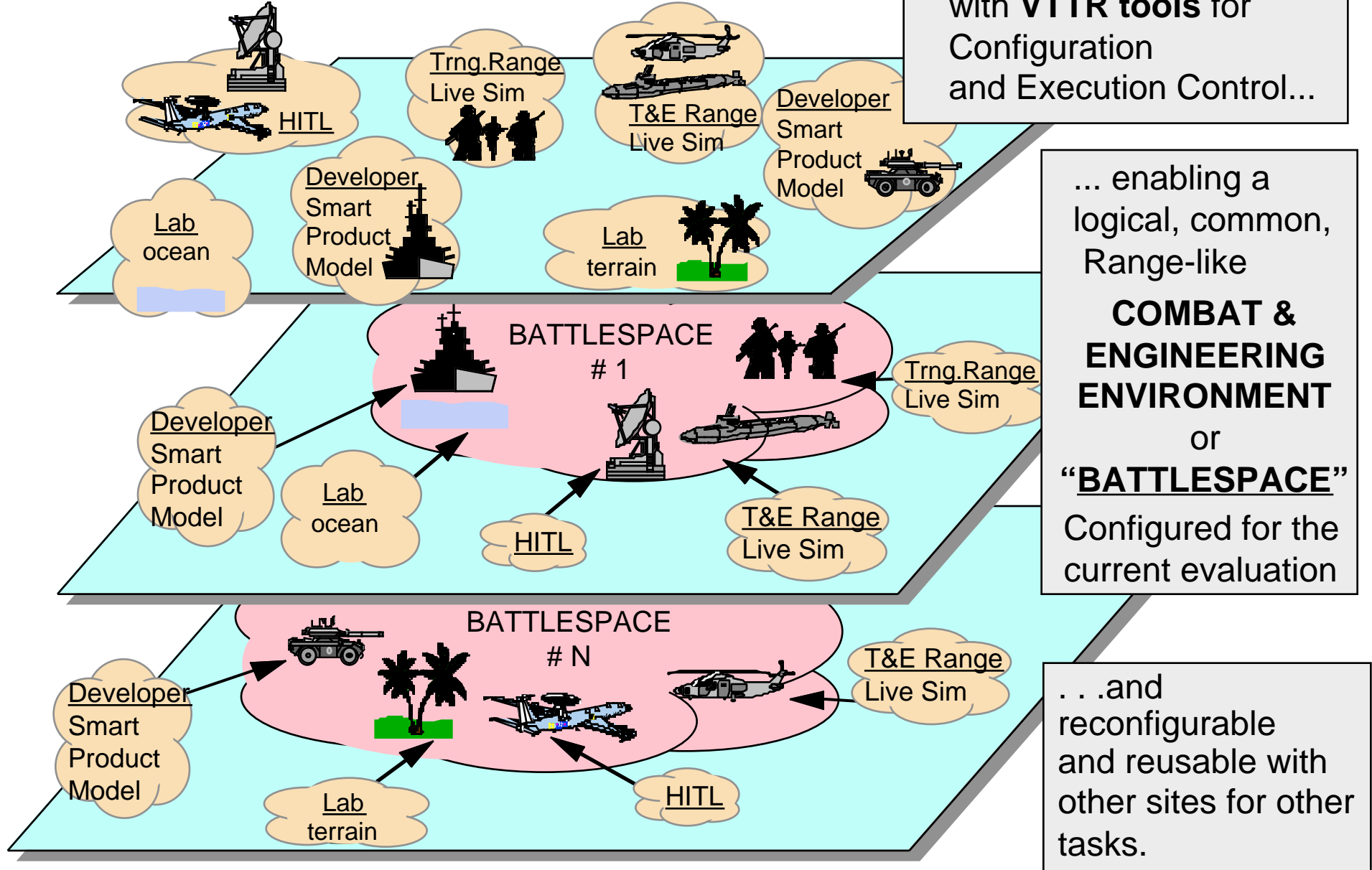
- **SC21 Partnership Program Assessment & Planning**
 - **ORD / COEA-Based “Simulation Resource” Requirements for:**
 - **Models and Simulations Needed for the Smart Product Model**
 - **Configuration & Execution Tools Needed for Efficient Access and Use of the Models and Simulators**
 - **Roadmap to assemble “Simulation Resources”**
 - **Models and Simulators - SC21 / Navy Responsibility**
 - **Configuration & Execution - VTTR / OSD Responsibility**

Evolutionary Steps - Build on Acceptance

Joint Synthetic T&E Battlespace



The “CONOPS” for the VTTR supported Battlespace



SC 21/VTTR Federation Test

- In FY 97, plan initial SC 21 Federation for synthetic battlespace
 - conform to HLA specification
 - use DARPA SBD tools as available
 - use existing tools for FOM creation and execution control
 - use infrastructure test criteria
- Develop scenario to test baseline federation
- Conduct federation testing in FY 98

Federation Infrastructure Test Criteria

- All simulations will be truly HLA compliant and not communicating via an HLA “wrapper” if that wrapper may artificially bound the data accessible from the simulation.
- The infrastructure will support testing that will allow multiple types of interacting simulations, including at least one Constructive, one Virtual, and one Live.
- The test will simulate presentations in more than one warfare area, reflecting the requirements for the SC 21 as expressed in the ORD.
- Test interactions will take place in real time, but the capabilities for logical time (i.e., faster than / slower than real time) will be considered in describing simulation capabilities.
- The pilot test will include multiple wide area network nodes, with the ideal number of nodes being 2 or 3.